



# Nitrogen Reactions

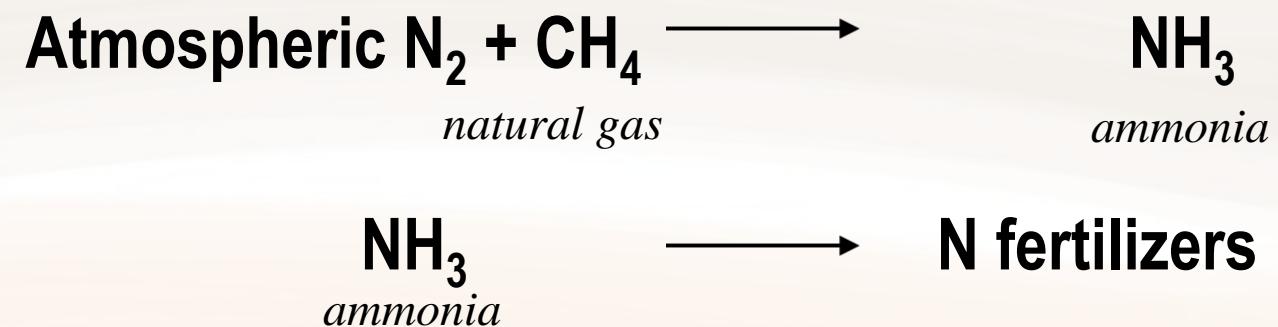
- Biological fixation (symbiotic)

**Atmospheric N<sub>2</sub>** —————→ **Legume Plant N**  
*(Rhizobia)*

*(Soil Temp. > 50 degrees F)*

# Nitrogen Reactions

- Biological fixation (symbiotic)
  - Chemical / industrial fixation





# Nitrogen Reactions

- Biological fixation (symbiotic)
- Chemical / industrial fixation
- **Mineralization (ammonification)**

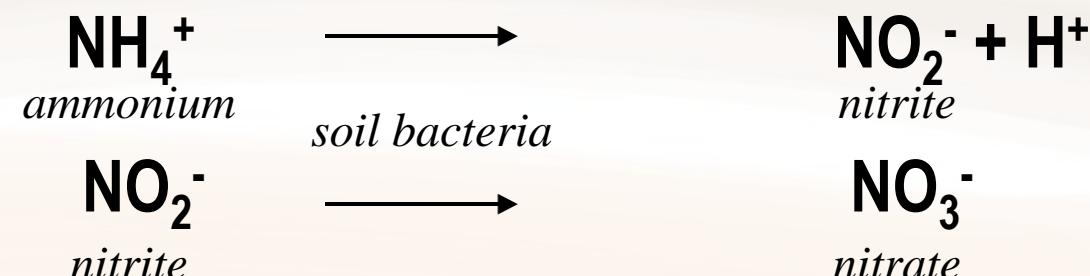


*(Soil Temp. > 50 degrees F)*



# Nitrogen Reactions

- Biological fixation (symbiotic)
- Chemical / industrial fixation
- Mineralization (ammonification)
- **Nitrification**



*(Soil Temp. > 50 degrees F)*

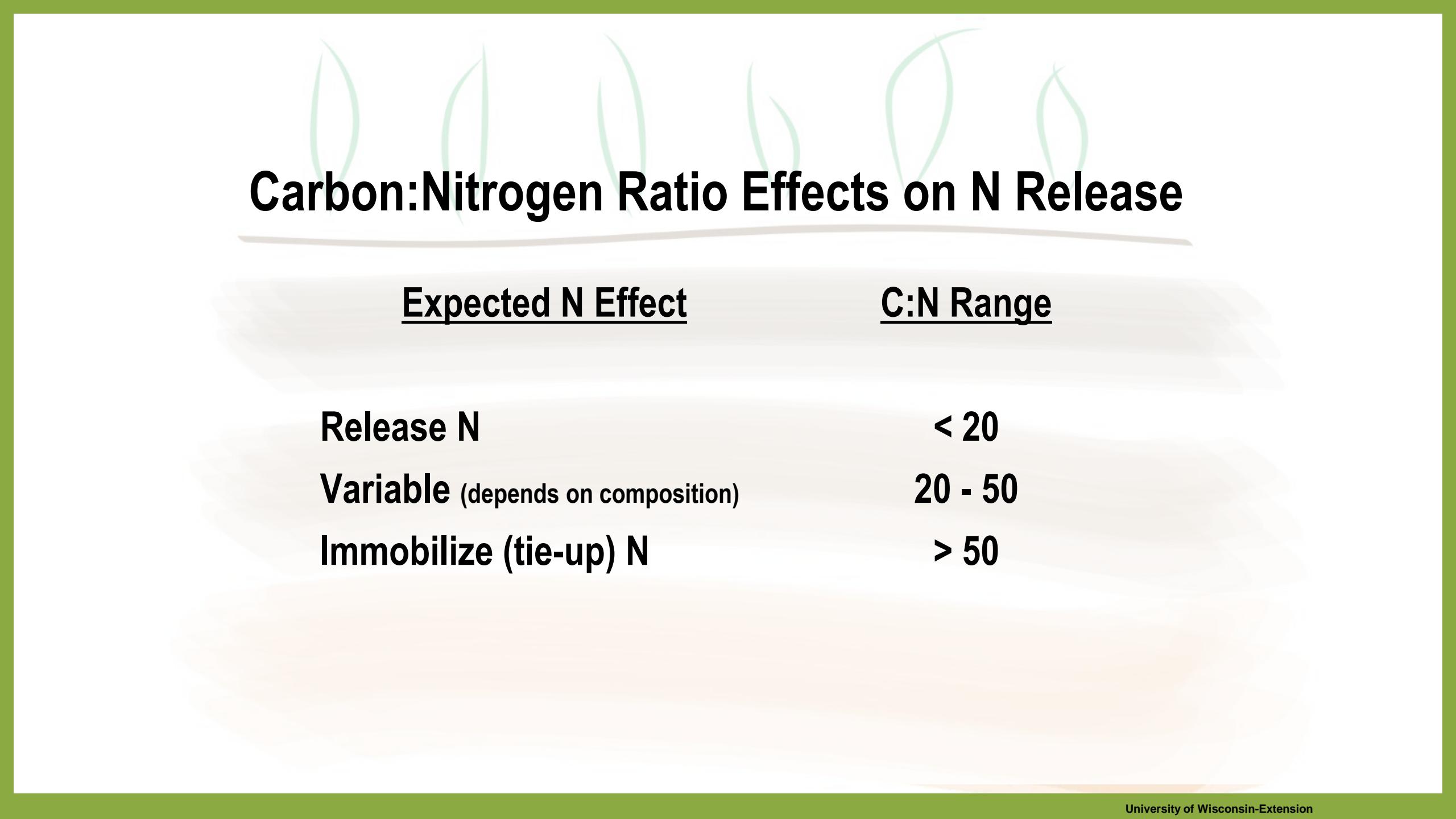


# Nitrogen Reactions

- Biological fixation (symbiotic)
- Chemical / industrial fixation
- Mineralization (ammonification)
- Nitrification
- Immobilization



*(Soil Temp. > 50 degrees F)*



# Carbon:Nitrogen Ratio Effects on N Release

## Expected N Effect

**Release N**

## C:N Range

< 20

**Variable** (depends on composition)

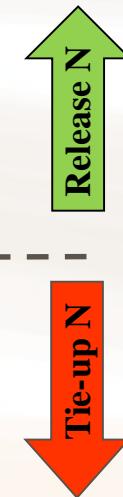
20 - 50

**Immobilize (tie-up) N**

> 50

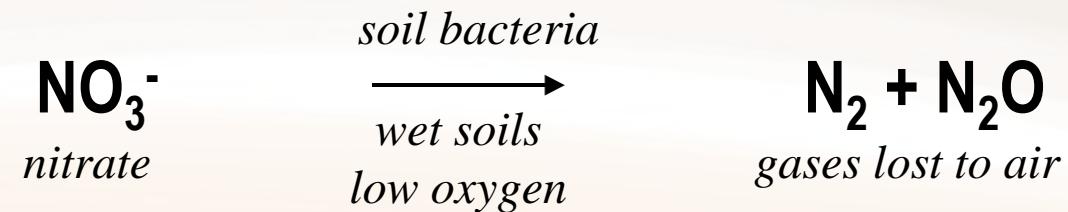
# Carbon:Nitrogen Ratios of Organic Materials

Material	C:N Ratio
Soil microorganisms	8
Soil organic matter	10
Alfalfa	12
Rotted manure	20
Corn residue	60
Grain straw	80
Sawdust	300



# Nitrogen Reactions

- Biological fixation (symbiotic)
- Chemical / industrial fixation
- Mineralization (ammonification)
- Nitrification
- Immobilization
- Denitrification



*(Soil Temp. > 50 degrees F)*